

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/AU03/01299

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>												
Int. CL <sup>7</sup> : E21C 41/26												
According to International Patent Classification (IPC) or to both national classification and IPC												
<b>B. FIELDS SEARCHED</b>												
Minimum documentation searched (classification system followed by classification symbols) IPC: E21C												
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU: E21C 41/26, 41/28, 41/30												
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPAT: (order+ or sequenc+) and (extract+ or mine or mining or remov+) and (material+ or coal or ore or mineral+) and (block+ or region+ or volume+)												
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>												
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.										
X, Y	S.C. Brierley and T. Atkinson: <u>Opencast Mining</u> The Mining Engineer, I.M.E. (UK), No. 99, December 1968, pp. 153-155	1-81										
X, Y	M.T. Pana: <u>The Simulation Approach to Open-Pit Design</u> Transactions of the Short Course and Symposium on Computers and Computer Applications in Mining and Exploration, University of Arizona, March 1965	1-81										
X, Y	L. Michael Kaas: <u>Computer Techniques for Production Scheduling and Blending of Taconite</u> Proceedings of the 26th Annual Mining Symposium, University of Minnesota, January 1965, pp 135-144	1-81										
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input type="checkbox"/> See patent family annex												
<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&amp;" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention											
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art											
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family											
"P" document published prior to the international filing date but later than the priority date claimed												
Date of the actual completion of the international search 3 November 2003		Date of mailing of the international search report 11 NOV 2003										
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer  <b>BARRY STEPHENS</b> Telephone No : (02) 6283 2106										

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>Helmut Lerchs &amp; Ingo F. Grossman: <u>Optimum Design of Open-Pit Mines</u> Transactions, C.I.M., Vol. LXVII, 1965, pp. 17-24</p>	1-81
Y	<p>James C. Bezdek, Richard J. Hathaway, Michael J. Sabin &amp; William T. Tucker: <u>Convergence Theory for Fuzzy c-Means: Counterexamples and Repairs</u> IEEE Transactions on Systems, Man, and Cybernetics, Vol. SMC-17 No. 5, pp 873-877 September/October 1987</p>	1-81
Y	<p>Christopher Wharton &amp; Jeff Whittle: <u>The Effect of Minimum Mining Width on NPV</u> Proceedings of the 1997 Whittle Conference "Optimizing with Whittle, Perth, WA, 1997</p>	1-81
Y	<p>R. Underwood &amp; B. Tolwinnski : <u>"A Mathematical Programming Viewpoint for Solving the Ultimate Pit Problem"</u> EJOR, 1998</p>	1-81
Y	<p>Louis Caccetta &amp; Stephen P. Hill: <u>An Application of Branch and Cut to Open Pit Mine Scheduling</u> <a href="http://rutcor.rutgers.edu/~do99/EA/SHill.doc">http://rutcor.rutgers.edu/~do99/EA/SHill.doc</a> 1999</p>	1-81

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### Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos :  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos :  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

### Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

- 1 Claims 1-7, 10, 12 directed to a method of aggregating a plurality of blocks.
  - 2.. Claims 8, 9, 11, 13 directed to a method of determining slope constraints.
  3. Claims 14-26 directed to a method of determining a cluster of material.
  4. Claims 27-39 directed to a method of determining characteristics of a selected portion of material.
- (Continued on Supplemental Sheet)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

#### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

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### Supplemental Box

(To be used when the space in any of Boxes I to VIII is not sufficient)

#### Continuation of Box No:

5. Claims 40-49 directed to a method of analysing a selected volume of material.
6. Claims 50-64 directed to a method of determining a selected group of blocks of a mine pit.